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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,713	09/25/2003	Satoru Fukuoka	031212	6383
38834 7590 08/22/2007 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036			EXAMINER ECHELMAYER, ALIX ELIZABETH	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 08/22/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/669,713	<b>Applicant(s)</b> FUKUOKA ET AL.	
	<b>Examiner</b> Alix Elizabeth Echelmeyer	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 9, 2007 has been entered.
2. Claim 1 has been amended. Claim 2 has been cancelled. Claims 1 and 3-5 are pending and are rejected for the reasons given below.

### ***Priority***

3. The certified translation of JP 2002-286103 has been received. The application has priority to September 30, 2002.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear whether the non-aqueous solvent is blended or not. For values of the main component of 100%, it would follow that the solvent was

pure. In those instance, the limitation of claim 1 to the non-aqueous solvent including a cyclic ester carbonate of cyclic lactone would be moot if the prior art taught a non-aqueous solvent having the one main component in the amount of 100% by volume.

***Claim Interpretation***

6. Claim 1 will be interpreted in two ways. The first interpretation is to a non-aqueous solvent having 100% by volume of a main component. The second interpretation is to a non-aqueous solvent having a second component in addition to the main component in an amount of less than 10% by volume.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamrock et al. (US Patent 6,063,522) in view of Sano et al. (US Pre-Grant Publication 2002/0086191).

Regarding claim 1, Hamrock et al. teach a non-aqueous electrolytic solution for a lithium cell containing linear ethers such as diethylene glycol dimethyl ether (DMG) (column 13 lines 52-59). This meets the first interpretation discussed above.

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As for applicants' claim 3, Hamrock et al. teach the use of conductive salts in the electrolyte composition (column 11 lines 45-50). Hamrock et al. list lithium bis (trifluoromethanesulfonyl) imide and lithium bis (pentafluoroethanesulfonyl) imide as preferred conductive salts (column 13 lines 20-25).

Regarding claims 4 and 5, Hamrock et al. teach  $\text{Li}_x\text{Mn}_2\text{O}_4$  and  $\text{Li}_x\text{MnO}_2$  as suitable cathode materials (column 14 lines 49-51).

Regarding claim 1, Hamrock et al. fail to teach the use of a separator having a melting point greater than 185 degrees Celsius.

Sano et al. teach the use of a separator in a battery cell that is capable of withstanding high temperatures ([0015]). Sano et al. teach that polyphenylene sulfide may be used as the separator, the same material used as the separator in the specification of the instant invention (claim 4 of Sano et al.).

Sano et al. further teach that the separator would be capable of withstanding high temperatures in order to suppress the vaporization of the electrolyte ([0015]).

It would be desirable to use the polyphenylene sulfide separator of Sano et al. in the battery of Hamrock et al. in order to suppress the vaporization of the electrolyte.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the polyphenylene sulfide separator of Sano et al. in the battery of Hamrock et al. in order to suppress the vaporization of the electrolyte.

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9. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamrock et al. in view of Sano et al. and Funatsu (US 5,478,673).

Regarding claim 1, Hamrock et al. teach a non-aqueous electrolytic solution for a lithium cell containing linear ethers such as diethylene glycol dimethyl ether (DMG) (column 13 lines 52-59).

As for applicants' claim 3, Hamrock et al. teach the use of conductive salts in the electrolyte composition (column 11 lines 45-50). Hamrock et al. list lithium bis (trifluoromethanesulfonyl) imide and lithium bis (pentafluoroethanesulfonyl) imide as preferred conductive salts (column 13 lines 20-25).

Regarding claims 4 and 5, Hamrock et al. teach  $\text{Li}_x\text{Mn}_2\text{O}_4$  and  $\text{Li}_x\text{MnO}_2$  as suitable cathode materials (column 14 lines 49-51).

Regarding claim 1, Hamrock et al. fail to teach the use of a separator having a melting point greater than 185 degrees Celsius.

Sano et al. teach the use of a separator in a battery cell that is capable of withstanding high temperatures ([0015]). Sano et al. teach that polyphenylene sulfide may be used as the separator, the same material used as the separator in the specification of the instant invention (claim 4 of Sano et al.).

Sano et al. further teach that the separator would be capable of withstanding high temperatures in order to suppress the vaporization of the electrolyte ([0015]).

It would be desirable to use the polyphenylene sulfide separator of Sano et al. in the battery of Hamrock et al. in order to suppress the vaporization of the electrolyte.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the polyphenylene sulfide separator of Sano et al. in the battery of Hamrock et al. in order to suppress the vaporization of the electrolyte.

With further regard to claim 1 and in view of the second interpretation discussed above, Hamrock et al. fail to teach a subsidiary component of the non-aqueous electrolyte in the amount of less than 10% by volume.

Funatsu teaches a non-aqueous electrolyte battery having a mixed solvent containing ethylene carbonate and a chain ether (abstract).

The mixed solvent of Funatsu contains 5%-40% ethylene carbonate and 60%-95% of the chain ether (column 3 lines 15-30).

Funatsu further teaches that the mixed solvent improves charge/ discharge capacity by preventing dendrite growth (column 3 lines 7-15).

It would be advantageous to use the blended solvent of Funatsu in the battery of Hamrock et al. in view of Sano et al. since it increases the charge/discharge capacity of the battery by preventing dendrite growth.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the blended solvent of Funatsu in the battery of Hamrock et al. in view of Sano et al. since it increases the charge/discharge capacity of the battery by preventing dendrite growth.

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***Response to Arguments***

10. Applicant's arguments with respect to claim 1, concerning the Takahashi (JP 2002-286103) reference, have been considered but are moot in view of the new grounds of rejection above.



**Conclusion**

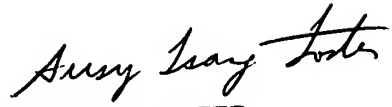
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alix Elizabeth Echelmeyer  
Examiner  
Art Unit 1745

aee

  
SUSY TSANG-FOSTER  
PRIMARY EXAMINER